Format No: CP/TF/01

## TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2018-04-03-07** **Date: 06-04-18** |
| **Customer** | : | Assistant Executive Engineer, Project Division, BBMP, Bangalore. |
| **Address** | : | Project Division, BBMP, Bangalore. |
| **Project Name** | : | Providing Granite Benches in Ward No.04. |
| **Agency** | : | Technical Manager (West), KRIDL, Bangalore. |
| **Customer's Reference** | : | EE(Project)/YnkZone/Wo/205/17-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 03-04-18 |
| **Sample ID No** | : | 2018-04-03-07 /01 |
| **Sample Type** | : | Zuari 53grade |
| **Reference to BIS codes** | : | IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification ,<br>IS 4031 (Part 1,2 3,4,5, 6,11):1988<br>IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4<br>IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5<br>IS 4031 Part 3, Determination of Soundness, Clause 5,Clause 6<br>IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5<br>IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5<br>IS 4031 Part 11,DETERMINATION OF DENSITY , Clause 6 |
| **Date of test** | : | 04-04-18 |
| **Environmental Conditions during test** | : | Temperature: 26°C<br>Humidity: 72% |

| Sl.No. | Physical properties | Results | Requirement as per IS 12269: 2013 |
|---|---|---|---|
| 1 | Fineness by dry sieving (%) | 1.08 | – |
| 2 | Finess by Air permeablity method ($m^2$/kg,Min) | 297.4 | 225$m^2$/kg, Min |
| 3 | Density (gm/cc) | 3.14 | – |
| 4 | Standard Consistency (%) | 28.5% | Not specified |
| 5 | Initial Setting time | 175 minutes | Not less than 30 minutes |
| 6 | Final Setting time | 285 minutes | Not more than 600 minutes |
| 7 | Soundness (Le Chatelier's Method) | 1.5mm | Not more than 10 mm |

**Note:**

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**R KARTHIK RECHAN**
Authorized Signatory
**Quality Manager**


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## TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2018-04-03-07** **Date: 02-05-18** |
| **Customer** | : | Assistant Executive Engineer, Project Division, BBMP, Bangalore. |
| **Address** | : | Project Division, BBMP, Bangalore. |
| **Project Name** | : | Providing Granite Benches in Ward No.04. |
| **Agency** | : | Technical Manager (West), KRIDL, Bangalore. |
| **Customer's Reference** | : | EE(Project)/YnkZone/Wo/205/17-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 03-04-18 |
| **Sample ID No** | : | 2018-04-03-07 /01 |
| **Sample Type** | : | Zuari 53grade |
| **Reference to BIS codes** | : | IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification ,<br>IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5<br>IS 4031 Part 6, Determination of Compressive Strength, Clause 6 |
| **Date of test** | : | 04-04-18 |
| **Environmental Conditions during test** | : | Temperature: 26˚C<br>Humidity: 72% |

**Compressive Strength**

| Sl.No. | Physical properties | Results | Requirement as per IS 12269: 2013 |
|---|---|---|---|
| 1 | 3 Days | 29.5N/mm$^2$ | Not less than 27 N/mm$^2$ |
| 2 | 7 Days | 39.5N/mm$^2$ | Not less than 37 N/mm$^2$ |
| 3 | 28 Days | 56.5N/mm$^2$ | Not less than 53 N/mm$^2$ |

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## TEST REPORT ON COARSE AGGREGATES

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2018-04-03-07** **Date: 06-04-18** |
| **Customer** | : | Assistant Executive Engineer, Project Division, BBMP, Bangalore. |
| **Address** | : | Project Division, BBMP, Bangalore. |
| **Project Name** | : | Providing Granite Benches in Ward No.04. |
| **Agency** | : | Technical Manager (West), KRIDL, Bangalore. |
| **Customer's Reference** | : | EE(Project)/YnkZone/Wo/205/17-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample condition** | : | Satisfactory |
| **Date of Receipt** | : | 03-04-18 |
| **Sample ID No** | : | 2018-04-03-07 /02(a) |
| **Sample Type** | : | 40mm down size coarse aggregate |
| **Reference to BIS codes** | : | IS: 383:2016 (Specification for Coarse and fine Aggregates )<br>IS: 2386 :1963(Part - 1,3,4) RA2011<br>IS 2386 Part 1: Particle Size and Shape<br>IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption<br>IS 2386 Part 4: Mechanical Properties |
| **Date of test** | : | 03-04-18 |

**SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:**

**Total weight taken : 15000 grams**

| Sample No. | Sieve No. | Weight Retained in gms | Cumulative Weight Retained in gms | % Cumulative Weight Retained | % Passing | Required as per IS 383:2016 |
|---|---|---|---|---|---|---|
| 1 | 80 mm | 0 | 0 | 0.0 | 100 | 100 |
| 2 | 40 mm | 245 | 245 | 1.6 | 98.4 | 90-100 |
| 3 | 20 mm | 6144 | 6389 | 42.6 | 57.4 | 30-70 |
| 4 | 10 mm | 4895 | 11284 | 75.2 | 24.8 | 10-35 |
| 5 | 4.75 mm | 3148 | 14432 | 96.2 | 3.8 | 0-5 |
| 6 | Pan | 568 | 15000 | 100.0 | 0 | --- |



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## TEST REPORT ON COARSE AGGREGATES

**Lab ID** : **CP-2018-04-03-07** **Date: 06-04-18**

**Sample ID No** : 2018-04-03-07 /02(a)

**PHYSICAL PROPERTIES**

| Sl.no | Tests | Result | Requirements as per IS:383-2016 |
|---|---|---|---|
| 1 | Flakiness Index(%) | 10.5 | Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate |
| 2 | Elongation Index(%) | 11.7 | |
| 3 | Specific Gravity | 2.63 | – |
| 4 | Bulk Density(Loose) (Kg/l) | 1.45 | – |
| 5 | Bulk Density(Compacted) (Kg/l) | 1.51 | – |
| 6 | Water Absorption(%) | 0.28 | – |

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**Quality Manager**



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## TEST REPORT ON COARSE AGGREGATES

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2018-04-03-07** **Date: 06-04-18** |
| **Customer** | : | Assistant Executive Engineer, Project Division, BBMP, Bangalore. |
| **Address** | : | Project Division, BBMP, Bangalore. |
| **Project Name** | : | Providing Granite Benches in Ward No.04. |
| **Agency** | : | Technical Manager (West), KRIDL, Bangalore. |
| **Customer Reference** | : | EE(Project)/YnkZone/Wo/205/17-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 03-04-18 |
| **Sample ID No** | : | 2018-04-03-07 /02(b) |
| **Sample Type/ Size** | : | 20mm down size coarse aggregate |
| **Reference to BIS codes** | : | IS: 383:2016 (Specification for Coarse and fine Aggregates )<br>IS: 2386 :1963(Part - 1,3,4) RA2011<br>IS 2386 Part 1: Particle Size and Shape<br>IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption<br>IS 2386 Part 4: Mechanical Properties |
| **Date of test** | : | 03-04-18 |

**SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:**

**Total weight taken : 5000 grams**

| Sample No. | Sieve No. | Weight Retained in gms | Cumulative Weight Retained in gms | % Cumulative Weight Retained | % Passing | Required as per IS 383:2016 |
|---|---|---|---|---|---|---|
| 1 | 40 mm | 0 | 0 | 0 | 100 | 100 |
| 2 | 20 mm | 199 | 199 | 4.0 | 96.0 | 90-100 |
| 3 | 10 mm | 3302 | 3501 | 70.0 | 30.0 | 25-55 |
| 4 | 4.75 mm | 1244 | 4745 | 94.9 | 5.1 | 0-10 |
| 5 | Pan | 255 | 5000 | 100 | 0 | – |



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## TEST REPORT ON COARSE AGGREGATES

**Lab ID** : **CP-2018-04-03-07** **Date: 06-04-18**

**Sample ID No** : 2018-04-03-07 /02(b)

### PHYSICAL PROPERTIES

| Sl.no | Tests | Result | Requirements as per IS:383-2016 |
|---|---|---|---|
| 1 | Flakiness Index(%) | 11.5 | Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate |
| 2 | Elongation Index(%) | 16.1 | |
| 3 | Specific Gravity | 2.61 | – |
| 4 | Bulk Density(Loose) (Kg/l) | 1.48 | – |
| 5 | Bulk Density(Compacted) (Kg/l) | 1.53 | – |
| 6 | Water Absorption(%) | 0.25 | – |
| 7 | Aggregate crushing Value(%) | 24.7 | Max 30% for Aggregates to be used in concrete for wearing Surface, In case Aggregate Crushing Value Exceeds 30% then the test for ten percent fines should be conducted for Aggregates to be used in concrete other than for wearing Surface. |
| 8 | Aggregate Impact Value(%) | 22.5 | 30% for Aggregates to be used in concrete for wearing Surface, 45% for Aggregates to be used in concrete other than for wearing Surface. |

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Authorized Signature
**Quality Manager**


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# TEST REPORT OF FINE AGGREGATE

| | | |
|---|---|---|
| Lab ID | : | CP-2018-04-03-07 |
| Customer | : | Assistant Executive Engineer, Project Division, BBMP, Bangalore. |
| Address | : | Project Division, BBMP, Bangalore. |
| Project Name | : | Providing Granite Benches in Ward No.04. |
| Agency | : | Technical Manager (West), KRIDL, Bangalore. |
| Customer's Reference | : | EE(Project)/YnkZone/Wo/205/17-18 |
| Source of Sample | : | Sample supplied by Agency |
| Sample Condition | : | Satisfactory |
| Date of Receipt | : | 03-04-18 |
| Sample ID No | : | 2018-04-03-07 /03 |
| Sample Type | : | Fine Aggregate |
| Reference to BIS codes | : | IS 383 : 2016 (Specification for Coarse and fine Aggregates)<br>IS: 2386 :1963(Part - 1, 3) RA2012<br>IS 2386 Part 1: Particle Size and Shape<br>IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption |
| Date of test | : | 03-04-18 |
| Total weight taken | : | 1000 grams |

**Date: 06-04-18**

| Sl.no | Sieve Size | Weight Retained (gms) | Cumulative Weight Retained (gms) | % Cumulative Weight Retained | % Passing | Requirement as per IS 383:2016 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Grading Zone I | Grading Zone II | Grading Zone III | Grading Zone IV |
| 1 | 10 mm | 0 | 0 | 0.0 | 100.0 | 100 | 100 | 100 | 100 |
| 2 | 4.75 mm | 22 | 22 | 2.2 | 97.8 | 90-100 | 90-100 | 90-100 | 95-100 |
| 3 | 2.36 mm | 135 | 157 | 15.7 | 84.3 | 60-95 | 75-100 | 85-100 | 95-100 |
| 4 | 1.18 mm | 187 | 344 | 34.4 | 65.6 | 30-70 | 55-90 | 75-100 | 90-100 |
| 5 | 600 micron | 207 | 551 | 55.1 | 44.9 | 15-34 | 35-59 | 60-79 | 80-100 |
| 6 | 300 micron | 248 | 799 | 79.9 | 20.1 | 5-20 | 8-30 | 12-40 | 15-50 |
| 7 | 150 micron | 105 | 904 | 90.4 | 9.6 | 0-10 | 0-10 | 0-10 | 0-15 |
| 8 | Pan | 96 | 1000 | 100.0 | 0.0 | --- | --- | --- | --- |

**Result :The tested Sample Conforms to Grading Zone II**



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# TEST REPORT OF FINE AGGREGATE

Lab ID : CP-2018-04-03-07

Date: 06-04-18

Sample ID No : 2018-04-03-07 /03

## PHYSICAL PROPERTIES

| SLno | Tests | Result | Requirements as per IS 383:2016 |
|---|---|---|---|
| 1 | Water Absorption(%) | 1.5 | – |
| 2 | Specific Gravity | 2.59 | – |
| 3 | Material finer than 75 micron(%) | 6.9 | Uncrushed fine Aggregate Max 3%, Crushed Fine aggregate Max 15%, Mixed Fine aggregate Max 12%, Manufactured Fine aggregate Max 10% |

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# TEST REPORT ON PHYSICAL REQUIREMENTS OF SOLID CONCRETE BLOCKS

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2018-04-03-07** **Date: 07-04-18** |
| **Customer** | : | Assistant Executive Engineer, Project Division, BBMP, Bangalore. |
| **Address** | : | Project Division, BBMP, Bangalore. |
| **Project Name** | : | Providing Granite Benches in Ward No.04. |
| **Agency** | : | Technical Manager (West), KRIDL, Bangalore. |
| **Customer's Reference** | : | EE(Project)/YnkZone/Wo/205/17-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 03-04-18 |
| **Sample ID No** | : | 2018-04-03-07 /07 |
| **Sample Type/Size** | : | Solid concrete blocks of size (400X150X200)mm |
| **Reference to BIS codes** | : | IS : 2185 (Part 1) : 2005(RA 2010) Concrete Masonry Specification<br>Part 1:Hollow and Solid Concrete Blocks (Dimensions -Annex-B, Clause 9.2 and 10 , Block density Annex -C Clause 9.3 and10, Compressive strength Annex -D Clause 9.4 and 10, Water absorption Annex -E Clause 9.5 and 10) |
| **Date of test** | : | 04-04-18 |

**BLOCK DENSITY:**

| Sl. No. | Measurement of overall Dimensions of Individual Blocks | | | Overall Volume of the Block in Cubic Centimetres | Weight of Oven Dried Block in Kilograms to the nearest 10 Gram | Block Density in Kg/cum*$10^6$ | Avg.Block Density in (Kg/cum) | As per IS 2185 (Part 1):2005 (RA 2010) |
|---|---|---|---|---|---|---|---|---|
| | Length | Breadth | Height | | | | | |
| | mm | mm | mm | ($Cm^3$) | Kg | $Kg/m^3$ | $Kg/m^3$ | |
| 1 | 402 | 151 | 203 | 12323 | 24.850 | 2016.6 | 2020.6 | Not less than 1800$Kg/m^3$ |
| 2 | 401 | 150 | 201 | 12090 | 24.780 | 2049.6 | | |
| 3 | 402 | 151 | 203 | 12323 | 24.590 | 1995.5 | | |

**WATER ABSORPTION:**

| Sl. No. | Wet weight after water absorption | Dry weight (Oven dry) | Water Absorption | Avg.Water Absorption | As per IS 2185 (Part 1):2005 (RA 2010) |
|---|---|---|---|---|---|
| | kg | kg | % | % | |
| 1 | 25.910 | 24.520 | 5.67 | 5.60 | Shall not be more than 10% by mass |
| 2 | 25.890 | 24.490 | 5.72 | | |
| 3 | 25.950 | 24.620 | 5.40 | | |



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